

WHAT IS CLAIMED IS:

1. A mixer device comprising:
an amplifier circuit including:
a first amplifier whose input-to-output
5 characteristic indicates a hyperbolic tangent function
characteristic;
a second amplifier whose input-to-output
characteristics indicates an exponential characteristic,
the second amplifier being connected in parallel to the
10 first amplifier; and
input and output terminals which are common to the
first amplifier and the second amplifier; and
a bias controller configured to control a bias of at
least one of the first and second amplifiers; and
15 an additional differential amplifier connected
between a node of the first amplifier and the second
amplifier and the output terminal.
2. A mixer device comprising:
an amplifier circuit including:
20 a differential amplifier whose input-to-output
characteristic indicates a hyperbolic tangent function
characteristic and which is configured by a differential
pair of transistors connected to a variable current
source;
- 25 a common emitter amplifier whose input-to-output
characteristic indicates an exponential characteristic

and which is connected in parallel to the differential amplifier and is configured by a pair of common-emitter configuration transistors;

input and output terminals which are common to the
5 differential amplifier and the common emitter amplifier,
an input signal being input to the input terminals and an
output signal output from the output terminals; and

a bias controller configured to control a bias of at
least one of the differential amplifier and the common
10 emitter amplifier; and

an additional differential amplifier connected
between a node of the differential amplifier and the
common emitter amplifier and the output terminal.

3. A mixer device comprising:

15 an amplifier circuit including:

a differential amplifier whose input-to-output
characteristic indicates a hyperbolic tangent
function characteristic and which is configured by a
differential pair of transistors whose emitters are
20 connected to a variable current source;

a common emitter amplifier whose input-to-
output characteristic indicates an exponential
characteristic and which is connected in parallel to
the differential amplifier and is configured by a
25 pair of common-emitter configuration transistors

whose emitters are grounded through a variable
voltage source;

5 input and output terminals which are common to
the differential amplifier and the common emitter
amplifier, an input signal being input to the input
terminals and an output signal from the output
terminals; and

10 a bias controller configured to control a bias
of at least one of the differential amplifier and
the common emitter amplifier; and

an additional differential amplifier connected
between a node of the differential amplifier and the
common emitter amplifier and the output terminal.